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tions has, so far as I can learn, not been noticed before, and such variations may have but trifling significance.

It would be interesting in this connection to know whether these abnormal appearances, if we may call them such, are more frequent in leaves which appear in the spring — those therefore whose fundamentals were laid down during the previous growing season — for we might suspect that the formation of the stiff, resistant bud scales of the winter buds, both during their first formation and their subsequent more or less irregular early spring development, would set up rather more pronounced, if not different, mechanical conditions than the scales or leaves of the more evenly developing summer buds.

I have to thank Miss Mary E. Hart for first drawing my attention to the variations in lilac leaves, and Miss Elsie M. Kupfer, who at my suggestion searched for and found a good number of fine examples of the same thing.

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## A KEY TO THE NORTH AMERICAN SPECIES OF LACTARIUS—I

BY F. S. EARLE

The species of this genus are at once distinguished from all other mushrooms by the flowing of a more or less abundant milky juice when cut or wounded. Many of the species are exceedingly acrid or peppery when raw but as is the case with the nearly allied *Russulas* this is said to disappear on cooking and most of the species are considered to be edible. So far as known, none of them contains a poison. As a rule they require longer cooking than most other mushrooms.

The most important paper on our American species is that by Peck in the 38th Report of the New York State Museum, in which he gives a synopsis and full descriptions of the species known to occur in the State. Of the following seventy-six species and varieties that have been reported as occurring in North America thirty-one have been described by Professor

Peck. Five others are supposed to be exclusively American while forty are common to this continent and Europe.

#### KEY TO THE SECTIONS OF THE GENUS

- |   |                         |
|---|-------------------------|
| 1. Stipe central or nearly so.  | 2.                      |
| Stipe excentric or lateral (none known from North America).                                 | Sec. PLEUROPUS.         |
| 2. Milk at first white, sometimes changing color on exposure.                               | 3.                      |
| Milk bright-colored (red, blue, etc.) from the first.                                       | Sec. DAPETES.           |
| 3. Lamellae not changing color with age, not pruinose; milk usually acrid (Sec. Piperates). | 4.                      |
| Lamellae pallid, then darker and pruinose; milk usually mild.                               | Sec. RUSSULARIA.        |
| 4. Pileus viscid, at least when young.  | 5.                      |
| Pileus dry, naked or clothed, not shining.  | Subsec. PIPERATI.       |
| 5. Margin of pileus naked from the first, pelliculose.                                      | Subsec. LIMACINI.       |
| Margin of pileus at first tomentose.  | Subsec. TRICHOLOMOIDEI. |

#### SUBSECTION TRICHOLOMOIDEI

- |  |                                     |
|--|-------------------------------------|
| 1. Milk white, soon changing to yellow.                                    | 2.                                  |
| Milk white, unchanging.  | 6.                                  |
| 2. Stipe scrobiculate-spotted; pileus yellow, depressed.                   | <i>L. scrobiculatus</i> (Scop.) Fr. |
| Stipe not spotted.   | 3.                                  |
| 3. Pileus large, 10-15 cm., deeply depressed or infundibuliform, glabrate. | 4.                                  |
| Pileus smaller, 4-10 cm., convex to subplane, villous.                     | 5.                                  |
| 4. Stipe villous.  | <i>L. resimus</i> Fr.               |
| Stipe glabrous.  | <i>L. regalis</i> Pk.               |
| 5. Pileus dingy flesh-color to pale reddish bluff.                         | <i>L. cilicioides</i> Fr.           |
| Pileus at first white, dirty yellow when old.                              | <i>L. cilicioides albus</i> Pk.     |
| 6. Pileus white or whitish.  | 7.                                  |
| Pileus brownish or olivaceous.   | 9.                                  |
| 7. Pileus azonate, glabrous, margin soon naked.                            | <i>L. subinsulsus</i> Pk.           |
| Pileus more or less zoned, clothed.  | 8.                                  |
| 8. Pileus white to pale ochraceous, tomentose.                             | <i>L. torminosus</i> (Schaeff.) Fr. |
| Pileus white, zoned and spotted with red, at first floccose.               | <i>L. controversus</i> (Pers.) Fr.  |
| 9. Pileus 6-20 cm., plane, flat; stipe tapering downward.                  | <i>L. turpis</i> Fr.                |
| Pileus 4-8 cm., convex, center depressed; stipe tapering upward.           | <i>L. sordidus</i> Pk.              |

#### SUBSECTION LIMACINI

- |   |                             |
|---|-----------------------------|
| 1. Pileus sordid white; milk changing to lilac.             | 2.                          |
| Pileus some shade of yellow; milk unchanging.               | 3.                          |
| Pileus reddish flesh-color becoming paler; milk unchanging. | <i>L. hyssiginus</i> Fr.    |
| Pileus some shade of gray; milk unchanging.                 | 5.                          |
| 2. Pileus azonate, thin, fragile, 5-8 cm.                   | <i>L. uvidus</i> Fr.        |
| Pileus obscurely zonate or concentric-spotted, larger.      | <i>L. uvidus magnus</i> Pk. |

- |   |                                  |    |
|---|----------------------------------|----|
| 3. Pileus azonate; spores white.                                      | <i>L. affinis</i> Pk.            |    |
| Pileus zonate or subzonate.   |                                  | 4. |
| 4. Stipe scrobiculate-spotted, hollow.                                | <i>L. insulsus</i> Fr.           |    |
| Stipe smooth, not spotted, solid.                                     | <i>L. zonarius</i> (Bull.) Fr.   |    |
| 5. Stipe spotted, hollow; pileus gray or grayish-lilac.               | <i>L. maculatus</i> Pk.          |    |
| Stipe not spotted (or rarely so in <i>L. trivialis</i> ).             |                                  | 6. |
| 6. Lamellae staining when wounded.                                    |                                  | 7. |
| Lamellae not staining.  |                                  | 9. |
| 7. Pileus gray with pink or lilac shades; lamellae staining greenish. |                                  | 8. |
| Pileus gray with greenish shades; lamellae staining cinereous.        | <i>L. blennius</i> Fr.           |    |
| 8. Pileus 5-18 cm.; stipe 2.5-15 cm. long.                            | <i>L. trivialis</i> Fr.          |    |
| Pileus 2.5-5 cm.; stipe equal to or longer than diameter.             | <i>L. trivialis gracilis</i> Pk. |    |
| 9. Lamellae and spores white; stipe 5-7 cm. long.                     | <i>L. cinereus</i> Pk.           |    |
| Lamellae and spores yellowish; stipe 4 cm. long.                      | <i>L. acer</i> (Bolt.) Fr.       |    |
- NEW YORK BOTANICAL GARDEN.

## THE PITH CELLS OF PHYTOLACCA DECANDRA \*

BY HENRY KRAEMER

The structure of pith cells is so characteristic and so constant for certain species and genera, as was pointed out by Gris, that it will in all probability be found to have a taxonomic value in deciding the position of a number of more or less disputed genera and families. While the anomalous structure of the root, stem and leaves of certain species of *Phytolacca* has been more or less carefully studied, the pith cells of *Phytolacca decandra* are so marked in character as to warrant our attention in this connection.

The pith of this plant is unusually large, its diameter being about five sixths that of the entire stem. The active pith cells are more or less hexagonal in transverse section, the diameter being about three times that of a longitudinal section. The protoplasm lies near the walls and contains a number of chloroplastids and a single nucleus, and surrounding the latter are not infrequently a number of plastids. Some of the cells, which are either nearly isodiametric or considerably elongated, have the large vacuoles replaced by raphides and a small amount of mucilage. The

\* Read before Section G of the American Association for the Advancement of Science, Pittsburg, July 3, 1902.